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XII.—*On the Shells of the Victoria Nyanza or Lake Oukéréwé.* By EDGAR A. SMITH.

[Plate XII. figs. 3-6, 8-16.]

THE first record of any shells from this great African lake appeared in the 'Proceedings of the Zoological Society' for 1864. In a list of the shells collected by Capt. Speke during his second journey through Central Africa Dr. H. Dohrn quoted the following from the lake, viz.:—1. *Limnæa*, sp.; 2. *Planorbis*, sp.; 3. *Lanistes Boltenianus*; 4. *Paludina* [= *Viviparus*] *unicolor*; 5. *Paludina* [= *Cleopatra*] *bulimoides*.

This collection was presented to the British Museum by Capt. Speke; but the localities attached to the above specimens make it very doubtful if any of them really were obtained from the Victoria Nyanza. Dohrn himself (*l. c.* p. 116) observes that "the specimens from different localities have been partly mixed up."

With the exception of the *Lanistes*, which are marked "from the Kanagwa and Uzandu district," the rest were transmitted to the Museum with the locality "Nile district, between 3° and 14° N. lat." The "gigantic specimen from the lake, more than twice as long as usual," of *Paludina bulimoides* is labelled "Usaramo, E. Africa, Plateau, 6° S.

lat." It is a variety of the *Cleopatra Guillemei* of Bourguignat and perfectly distinct from *bulimoides*, having the upper whorls sharply angled and the base of the body-whorl around the umbilicus encircled with five strong concentric liræ.

Considering, therefore, the doubt attaching to the localities of the specimens in question, it seems to me advisable to exclude these five species from the list of the lake shells until their occurrence there has been further established.

The next mention of shells from the Oukéréwé lake occurs in the 'Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin' for 1879. At p. 105 Dr. E. von Martens enumerated nine species collected by Emmin Effendi in 1877 on the south-west shores, as follows:—1. *Physa*, sp.; 2. *Planorbis choanomphalus*, sp. n.; 3. *Paludina rubicunda*, sp. n.; 4. *Paludina capillata*, Frfld.; 5. *Bythinia Stanleyi*, Smith; 6. *Melania tuberculata*, var.; 7. *Unio Bakeri*, H. Adams; 8. *U. acuminatus*, H. Ad.; 9. *Corbicula radiata*, Phil.

M. Bourguignat in 1883 (Moll. fluv. du Nyanza Oukéréwé), unaware of the papers by Dohrn and Martens, mentioned the following ten species as the first recorded from this locality:—1. *Melania tuberculata*; 2. *Vivipara abyssinica*; 3. *Mutela subdiaphana*; 4. *Unio Hauteceuri*; 5. *U. Grandidieri*; 6. *U. Duponti*; 7. *U. Ruellani*; 8. *U. Edwardsianus*; 9. *U. Grantianus*; 10. *U. Monceti*.

In 1885 ('Espèces nouv. et gen. nouv. Oukéréwé et Tanganika') he described the following:—*Cleopatra Guillemei*, *Mutela Bourguignati*, and *Spatha Bourguignati*.

Finally in 1887 (Bull. Soc. Malac. France, vol. iv. pp. 267-272) he enumerated the thirteen species known to him from the lake, and described two others, *Limncea Debaizei* and *Unio Lourdeli*.

I now add to the preceding three new species of *Viviparus*, *Mutela rubens*, Lamk., and *Limosina parasitica* (Parreyss), so that the complete list of the known shells from the lake is here given.

The fauna of the Victoria Nyanza, as far as we know it at present, appears to be quite Nilotic, and no such remarkable forms as occur in Lake Tanganyika have as yet been met with. It does not possess a specialized fauna like that lake, and out of the twenty-eight species hereafter enumerated twelve have been recorded from the Nile or one or other of the great lakes, and of the remaining sixteen so-called species very close representatives occur in other lakes and rivers of Central Africa.

I. GASTROPODA.

1. *Limnæa Debaizei*, Bourguignat.

Limnæa Debaizei, Bourguignat, Bull. Soc. Mal. France, 1887, vol. iv. p. 268.

This species also occurs at Bagamoyo (*Bourg.*). It evidently is very closely allied to *L. natalensis*, Krauss.

2. *Physa*, sp.

Physa, sp., Martens, SB. Gesell. nat. Freund. Berlin, 1879, p. 103.

Hab. South-west shore.

Perhaps *P. nyassana*, Smith (*Martens*).

3. *Planorbis choanomphalus*, Martens.

Planorbis choanomphalus, Martens, l. c. p. 103.

From the south-west shore.

4. *Melania tuberculata*, Müller, var.

Melania tuberculata, Müller, var., Martens, l. c. p. 104; Bourguignat, Moll. fluv. du Nyanza Oukéréwé, 1883, p. 4.

Hab. South and south-west shore.

5. *Viviparus abyssinicus*, Martens.

Vivipara abyssinica, Bourguignat, l. c. 1883, p. 4.

Hab. South end of the lake.

6. *Viviparus rubicundus*, Martens.
(Pl. XII. fig. 3.)

Paludina rubicunda, Martens, l. c. p. 104; Smith, P. Z. S. 1888, p. 53, as *Paludina unicolor*, var.

Hab. South-west shore (*Martens*); Nile region between 3° and 14° N. lat. (*Speke*, in B. M.); Albert Nyanza (*Smith*).

This is a very pretty species, distinguished by its pinkish colour and rounded whorls.

7. *Viviparus capillatus*, Frauenfeld.

Paludina capillata, Martens, l. c. p. 104.

Hab. South shore (*Martens*); Lake Nyassa (*Erfd.*).
9*

Martens only had young specimens under examination, and it seems to me possible that they may be referable to the following species, as he mentions their possessing two distinct keels. *V. capillatus* has an angle at the periphery and a shouldering above, but it cannot be described as carinate.

8. *Viviparus victoriæ*. (Pl. XII. figs. 8-10.)

Paludina, sp. n., Smith, Ann. & Mag. Nat. Hist. August 1890, p. 149.

Testa umbilicata, conica, mediocriter tenuis, epidermide olivacea nitida induta, ad apicem plus minus erosa, purpurea; anfractus 6, convexiusculi, inferne ad suturam carinati, interdum paulo supra medium leviter carinati vel angulati, lineis incrementi obliquis flexuosis, striisque spiralibus tenuissimis sculpti, ultimus circa medium carinatus, plerumque ad aperturam leviter infra carinam descendens; apertura subcircularis, longit. totius $\frac{2}{5}$ adæquans, intus submargaritacea; perist. ad marginem nigrescens, latere columellari leviter incrassato.

Longit. 33 millim., diam. 20; apertura 14 longa, $12\frac{1}{2}$ lata.

Var. *a*. Testa vix umbilicata, anfractu ultimo fortiter et acute carinato, carina supra spiram pagodiformem continua.

Var. *b*. Testa minor, vix perforata, solidior, carinis fere obsoletis, anfractibus magis rotundatis, epidermide magis strigata.

I have set aside certain specimens as varieties *a* and *b* chiefly to call attention to the great variability of this species. At first sight it seems hardly credible that the var. *b* can belong to the same species as the type. However, the series of specimens in the Museum apparently proves them to be so. The strength of the carination, the size of the umbilicus, and the size of the shells themselves are very variable; but even in specimens which are least keeled traces of the keels are noticeable. The slight angulation near and a little above the middle of the whorls of the spire is more distinct in some specimens than others, and the spiral sculpture is also distinct in some instances, feeble in others.

In the var. *a* the strong keel of the body-whorl revolves up the spire a little above the suture, so that the spire presents a pagodiform appearance. In these specimens also the termination of the keel modifies the form of the aperture, producing a slight angle in the middle of the outer lip.

9. *Viviparus jucundus*. (Pl. XII. fig. 6.)

Testa parva, imperforata, ovato-turrita, haud nitida, epidermide tenui olivacea induta, ad apicem erosa; anfractus 5, convexiusculi, sutura profunda sejuncti, lineis incrementi obliquis conspicuis,

aliisque spiralibus tenuibus confertis decussatis sculpti, ultimus in medio angulatus, antice haud descendens; apertura ovato-auriformis, longit. totius $\frac{1}{2}$ adæquans: peristoma tenue, vix continuum, marginibus callo tenuissimo nitente junctis, columellari leviter incrassato, subreflexo.

Longit. 14 millim., diam. $9\frac{1}{2}$; apertura 7 longa, $5\frac{1}{3}$ lata.

This species is remarkable for its small size, the dull, spirally and obliquely striated surface, and the peripheral angulation of the body-whorl. It was obtained at the Victoria Nyanza by Bishop Hannington.

This is not the young of *V. victoriae*, but evidently a species which does not attain larger dimensions than those given above. It is distinguished from that species not only by its size but by the more distinct spiral sculpture, the more shouldered whorls, the deeper suture, and the absence of an umbilicus.

10. *Viviparus cepoides*. (Pl. XII. fig. 4.)

Testa anguste umbilicata, ovata, turrata, tenuis, epidermide viride induta, strigis obliquis saturate olivaceis zonisque vel lineis paucis obsoletis picta, parum nitida, interdum limbo rufo oblecta; anfractus 6, convexi, superne humerosi, incrementi lineis obliquis striisque spiralibus plus minus obsoletis sculpti, sutura profunda sejuncti; ultimus rotundatus, ad peripheriam haud angulatus; apertura magna, ovato-rotundata, intus cæruleo-alba, longit. totius $\frac{1}{2}$ adæquans; peristoma tenue, marginibus callo tenui junctis, columellari leviter incrassato, sed vix reflexo.

Longit. 33 millim., diam. maj. $22\frac{1}{2}$; apertura $17\frac{1}{2}$ longa, $13\frac{1}{2}$ lata.

Hab. Either the Victoria Nyanza or from the Nile between 3° and 14° N. lat. (*Capt. Speke*).

This species is comparatively thin and is remarkable for the shouldering of the whorls, the deep suture, the green-striped epidermis, and the large aperture. The spiral striæ, although not strong, are quite apparent, being more conspicuous around the umbilicus than elsewhere.

All the four specimens collected by Capt. Speke were more or less coated with a rust-like deposit. They vary very little, excepting the spire may be somewhat longer in some specimens than others.

11. *Cleopatra Guillemei*, Bourguignat. (Pl. XII. fig. 5.)

Cleopatra Guillemei, Bourguignat, Esp. nouv. et gen. nouv. Oukéréwé et Tanganika, p. 6.

Like *C. bulimoides* (Olivier), but readily distinguished by the grooves around the umbilicus.

12. *Bithynia Stanleyi*, Smith, var. *humerosa*.*Bithynia Stanleyi*, Smith, var. *humerosa*, Martens, l. c. p. 104.*Hab.* South-west shore (M.) ; Lake Nyassa (Smith).

II. PELECYPODA.

13. *Corbicula radiata*, Parreyss.*Hab.* River Nile ; also Lakes Albert, Tanganyika, and Nyassa, Victoria Nyanza (Martens).

I have already quoted this species from the Victoria Nyanza (Ann. & Mag. Nat. Hist., Aug. 1890, p. 149). It was obtained on the south shore of the lake both by Emin Pasha and the late Bishop Hannington. Some of the specimens are without rays, other examples, in addition to the violet rays, exhibit others of a rich brown or reddish colour. The epidermis is variable, being olive-green, greenish yellow, or simply yellow.

14. *Limosina parasitica* (Parreyss).*Hab.* First Cataract at Assouan on the Upper Nile (Parreyss).

This species is considered by Clessin (Conch.-Cab. Monog. Cycladeen, p. 247) synonymous with *L. ferruginea*, Krauss*. On comparing specimens of these forms received from Parreyss and Krauss they appear to differ somewhat both in form and sculpture. *L. parasitica* is slightly longer and narrower and the concentric lines are stronger and more lamellar. The specimens obtained at the Victoria Nyanza by Bishop Hannington are exactly similar to those from Assouan.

15. *Unio Bakeri*, H. Adams. (Pl. XII. fig. 11.)*Unio Bakeri*, Martens, l. c. p. 104.*Hab.* South-west shore (M.) ; Albert Nyanza (Sir Samuel Baker and Emin Pasha).

I have already (P. Z. S. 1888, p. 56) pointed out the similarity between this and some of the following species described by Bourguignat, and it seems very probable that the shells referred to the present species by Dr. E. von

* Besides South Africa I have already quoted this species from Madagascar and Mauritius (P. Z. S. 1882, p. 388).

Martens belong rather to one or other of Bourguignat's species than to this Albert Nyanza form.

16. *Unio acuminatus*, H. Adams. (Pl. XII. fig. 12.)

Unio acuminatus, Martens, *l. c.* p. 105.

Hab. South-west shore (*M.*) ; Albert Nyanza (*Baker*).

As suggested by Bourguignat, this species is allied to the *U. Monceti* of that author, and therefore it is not impossible that the shells referred to it by Martens may really belong to *Monceti*, as they come from the same lake.

17. *Unio Hautteccœuri*, Bourguignat.

Unio Hautteccœuri, Bourguignat, 1883, Moll. fluv. Oukéréwé, p. 5, figs. 1-3.

18. *Unio Grandidieri*, Bourguignat.

Unio Grandidieri, Bourguignat, *l. c.* p. 7, figs. 4-6.

19. *Unio Edwardsianus*, Bourguignat.

Unio Edwardsianus, Bourguignat, *l. c.* p. 12, figs. 7-9.

20. *Unio Duponti*, Bourguignat.

Unio Duponti, Bourguignat, *l. c.* p. 8, figs. 10-12.

21. *Unio Grantianus*, Bourguignat.

Unio Grantianus, Bourguignat, *l. c.* p. 14.

Of the five preceding so-called species it is impossible to suppose that the variation in form and sculpture pointed out by Bourguignat would be at all constant. At all events my experience with regard to the Unionidæ of the great Central-African lakes proves that great variation both in outline and ornamentation is constantly met with in many species. I am therefore inclined to believe that these species of M. Bourguignat are merely variations of one and the same species.

22. *Unio Monceti*, Bourguignat.

Unio Monceti, Bourguignat, *l. c.* p. 15, figs. 13-15.

23. *Unio Ruellani*, Bourguignat.

Unio Ruellani, Bourguignat, *l. c.* p. 10, figs. 16-18.

24. *Unio Lourdeli*, Bourguignat.
(Pl. XII. figs. 13-15.)

Unio Lourdeli, Bourguignat, Bull. Soc. Mal. France, 1887, vol. iv. p. 271.

This is an elongate posteriorly rostrate form and quite distinct from the rest of the species from the lake. The shells figured are in the collection of S. I. Da Costa, Esq.

25. *Mutela rubens*, Lamarck.

Mutela rubens, Smith, Ann. & Mag. Nat. Hist., Aug. 1890, p. 149.

There is a single valve from the lake obtained by Emin Pasha and presented by him to the British Museum.

26. *Mutela subdiaphana*, Bourguignat.

Mutela subdiaphana, Bourguignat, Moll. fluv. Oukéréwé, 1883, p. 5; Bull. Soc. Mal. France, 1887, vol. iv. p. 268.

Apparently no description of this species has as yet appeared.

27. *Mutela Bourguignati*, Ancy.

(Pl. XII. fig. 16.)

Mutela Bourguignati, Bourguignat, Espèces nouv. et gen. nouv. Oukéréwé et Tanganika, 1885, p. 8.

Hab. Shores of the lake, near the mouth of the Chinnayou (*Bourg*); also Emin Pasha in Brit. Mus.

28. *Spatha (Spathella) Bourguignati*, Ancy.

Spatha (Spathella) Bourguignati, Bourguignat, l. c. 1885, p. 12.

Hab. South shore of the lake (*Bourguignat and Emin Pasha*).

EXPLANATION OF PLATE XII. (part).

Fig. 3. *Viviparus rubicundus*.

Fig. 4. *Viviparus cepoides*.

Fig. 5. *Cleopatra Guillemei*.

Fig. 6. *Viviparus jucundus*.

Fig. 8. *Viviparus victoriæ* (var. *b*).

Fig. 9. *Viviparus victoriæ* (typical).

Fig. 10. *Viviparus victoriæ* (var. *a*).

Fig. 11. *Unio Bakeri*.

Fig. 12. *Unio acuminatus*.

Figs. 13-15. *Unio Lourdeli*.

Fig. 16. *Mutela Bourguignati*.